Quasi-neutral Vlasov theory of magnetized plasmas[1] CESARE
TRONCI, University of Surrey, ENRICO CAMPOREALE, Centrum Wiskunde &
Informatica — The low-frequency limit of Maxwell equations is considered in the
Maxwell-Vlasov system. This limit produces a quasi-neutral Vlasov system [1] that
captures essential features of plasma dynamics, while neglecting radiation effects.
Euler-Poincaré reduction theory is used to show that the quasi-neutral Vlasov the-
ory possesses a variational formulation in both Lagrangian and Eulerian coordinates.
By construction, the new model recovers all collisionless neutral models employed
in plasma simulations. Then, comparisons between the quasi-neutral Vlasov system
and hybrid kinetic-fluid models are presented in the linear regime.

[1] C. Tronci, E. Camporeale, Neutral Vlasov kinetic theory of magnetized plasmas,
Phys. Plasmas, 22 (2015), no. 2, 020704

Cesare Tronci
University of Surrey

Date submitted: 07 Jul 2015   Electronic form version 1.4